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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,611	12/03/2001	Tadashi Ohmori	JP920000393US1	6604

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EXAMINER

CHEN, TSE W

ART UNIT	PAPER NUMBER
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2116

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

47

Office Action Summary

Application No.

10/010,611

Applicant(s)

OHMORI ET AL.

Examiner

Tse Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15, 16, 18, 19, 21 and 27-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15, 16, 18, 19, 21 and 27-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment dated June 27, 2005.

2. Claims 15-16, 18-19, 21, and 27-35 are presented for examination. Applicant has canceled claims 1-14, 17, 20, and 22-26.

Claim Rejections - 35 USC § 112

3. Claims 15-16, 18-19, 30 and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant did not disclose the subject matters of “wherein the data signal slew rate is set higher if the cable has 80 wires rather than 40 wires” and “wherein the variable control signal slew rate is set lower if the cable has 80 wires rather than 40 wires” in the original specification. Therefore, said subject matters are considered new and not eligible for prosecution in this application.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 21 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Wakeley, US Patent 6463499, in view of Kuroiwa, US Patent 6432731, Clow et al., US Patent

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6005890, hereinafter Clow, Lee, US Patent 6604220, and Zou et al., US Patent 6154101, hereinafter Zou.

6. Wakeley discloses a computer system [fig.1] comprising [col.1, ll.23-51]:

- A host system [10].
- A hard disk drive [12].
- A cable [14] for connecting a host system interface [22] and a hard disk drive interface [36], said cable comprising multiple data signal lines and at least one control signal line allocated in parallel [20a, 20b, 40a, 40b].
- At least one driver in said host system and at least one driver in said hard disk drive, each said at least one driver in said host system and each said at least one driver in said hard disk drive being capable of generating a data signal and a control signal [inherently, some drivers in the broadest interpretation is needed to drive the control and data signals across the cable between two devices], each said data signal having a data signal slew rate and each said control signal having a control signal slew rate [inherently, some slew rates are associated with each data and control signal].

7. Wakeley did not discuss the details of slew rates.

8. Kuroiwa discloses a data transfer system [fig.1] comprising a control signal having a variable control signal slew rate [varied according to table] and a table [library] containing an optimum value of the control signal slew rate [slew rate Tmax], the optimum value dependent on a quantity of devices [loads] connected [col.6, l.53 – col.7, l.37; col.8, ll.10-17].

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9. Clow discloses a computer system [fig. 1] comprising a data signal [12] having a variable data signal slew rate and an optimum value [through adjustments] of a control signal slew rate being dependent on an error rate measured [col. 5, 1.65 – col. 6, 1.7].

10. Lee discloses a computer system comprising an error rate measured in the hard disk drives using ECC [col. 3, 1.33 – col. 2, 1.5].

11. Zou discloses a data transfer system [fig. 5] comprising a table containing a value of the control signal slew rate, wherein the host system [500] sets a value of the control signal slew rate in a control driver [PN generator] [col. 3, 1.64 – col. 4, 1.47].

12. It would have been obvious to one of ordinary skill in the art, having the teachings of Zou, Kuroiwa, Wakeley, Clow and Lee before him at the time the invention was made, to modify the system taught by Wakeley to include the teachings of Zou, Clow, Lee and Kuroiwa, in order to obtain the data transfer system comprising a table containing an optimum value of said control signal slew rate, said optimum value dependent on a quantity of hard disk drives connected to said host system and an error rate measured in the hard disk drives using ECC, wherein said host system sets said optimum value of said control signal slew rate in said control driver upon said host system determining said quantity of hard disk drives and said error rate in the hard disk drives. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to control the slew rate for optimal communication [Clow: col. 1, 1.55 – col. 3, 1.25] [Kuroiwa: col. 3, 11.21-61; determination of accurate slew rate based on quantity of devices is important] [Zou: col. 1, 11.6-10; speedy alteration of slew rates for optimal response] and increase storage capacity while reducing error rates [Lee: col. 1, 1.33 – col. 2, 1.5].

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13. As to claim 33, Kuroiwa discloses, wherein the table [library] is stored in an AT Controller [300, 302] in the host system [fig.5] [col.6, l.53 – col.7, l.37; col.8, ll.10-17].

14. Claims 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakeley, in view of Faunce, US Patent 5081646, Kuroiwa, Clow, Lee, and Zou.

15. In re claim 27, Wakeley discloses a data transfer system [fig.1] comprising [col.1, ll.23-51]:

- A plurality of data lines for transferring data signals and at least one control line for transferring a control signal, said plurality of data lines and said at least one control line being allocated in parallel [20a, 20b, 40a, 40b].
- A data driver connected to at least one of said plurality of data lines [inherently, some driver in the broadest interpretation is needed to drive the data signals across the cable between two devices].
- A control driver connected to at least one of said at least one control line [inherently, some driver in the broadest interpretation is needed to drive the control signal across the cable between two devices].
- A host system [10] coupled to send and receive said data signals and said control signal to and from at least one hard disk drive [12].

16. Wakeley did not discuss the details of slew rates.

17. Faunce discloses a data transfer system [abstract] comprising:

- A plurality of data lines for transferring data signals [d0-7] and at least one control line for transferring a control signal [strobe], said plurality of data lines and said at least one control line being allocated in parallel [fig.2, col.1, ll.10-24].

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- Setting a data signal slew rate and a control signal slew rate such that said data signal slew rate is smaller than said control signal slew rate [col.2, ll. 16-30; low pass filtering of data lines makes slew of data lines smaller than strobe with is delayed to compensate], wherein a setup time for said data signals is shortened [col.2, ll. 11-15; slower slew rate reduces a setup time margin to maintain speed advantage], and wherein cross-talk in said data lines remains low due to said data signal slew rate remaining small [col.2, ll. 16-21].

18. Kuroiwa discloses a data transfer system [fig. 1] comprising a control signal having a variable control signal slew rate [varied according to table] and a table [library] containing an optimum value of the control signal slew rate [slew rate Tmax], the optimum value dependent on a quantity of devices [loads] connected [col.6, l.53 – col.7, l.37; col.8, ll. 10-17].

19. Clow discloses a computer system [fig. 1] comprising a data signal [12] having a variable data signal slew rate and an optimum value [through adjustments] of a control signal slew rate being dependent on an error rate measured [col.5, l.65 – col.6, l.7].

20. Lee discloses a computer system comprising an error rate measured in the hard disk drives using ECC [col.3, l.33 – col.2, l.5].

21. Zou discloses a data transfer system [fig. 5] comprising a table containing a value of the control signal slew rate, wherein the host system [500] sets a value of the control signal slew rate in a control driver [PN generator] [col.3, l.64 – col.4, l.47].

22. It would have been obvious to one of ordinary skill in the art, having the teachings of Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee before him at the time the invention was made, to modify the system taught by Wakeley to include the teachings of Faunce, Zou, Clow, Lee and Kuroiwa, in order to obtain the data transfer system comprising a table containing an optimum

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value of said control signal slew rate, said optimum value dependent on a quantity of hard disk drives connected to said host system and an error rate measured in the hard disk drives using ECC, wherein said host system sets said optimum value of said control signal slew rate in said control driver upon said host system determining said quantity of hard disk drives and said error rate in the hard disk drives. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to control the slew rate for optimal communication [Faunce: col.1, 1.35 – col.2, 1.8; improves communication over extended distance] [Clow: col.1, 1.55 – col.3, 1.25] [Kuroiwa: col.3, ll.21-61; determination of accurate slew rate based on quantity of devices is important] [Zou: col.1, ll.6-10; speedy alteration of slew rates for optimal response] and increase storage capacity while reducing error rates [Lee: col.1, 1.33 – col.2, 1.5].

23. As to claim 29, Kuroiwa discloses, wherein the table [library] is stored in an AT Controller [300, 302] in the host system [fig.5] [col.6, 1.53 – col.7, 1.37; col.8, ll.10-17].

24. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee as applied to claim 27 above, and further in view of Clay et al., US Patent 5459850, hereinafter Clay.

25. Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee disclose each and every limitation as discussed above in reference to claim 27. Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee did not disclose explicitly that the table is stored in the hard disk drive.

26. Clay discloses a data transfer system [fig.1], wherein a table is stored in an ATA interface circuit in the hard disk drive [solid state drive emulating hard disk drive] [col.2, 1.33 – col.3, 1.24].

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27. It would have been obvious to one of ordinary skill in the art, having the teachings of Clay, Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee before him at the time the invention was made, to modify the system taught by Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee to include the teachings of Clay, in order to obtain the data transfer system wherein the table is stored in an ATA interface circuit in the hard disk drive. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to maintain and reference specific characteristics of an attaching device [Clay: col.2, l.33 – col.3, l.24].

28. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee as applied to claim 27 above, and further in view of Do et al., US Patent 5859552, hereinafter Do.

29. Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee disclose each and every limitation as discussed above in reference to claim 27. Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee did not disclose the details of a DRU.

30. Do discloses a DRU [fig.1] wherein the DRU comprises:

- Means for inputting a SRC signal [260] to a plurality of switches [42], wherein each switch is turned to a first or second position according to a bit in the SRC signal [fig.4]
- A separate DLC coupled to each of the switches [pair of MOS and resistors constitute DLC with delayed threshold voltage activation] [col.4, ll.1-45].
- A plurality of stage inverters [46, 48, ...], wherein a separate stage inverter is coupled to each of the DLCs [fig.1].
- Means for inputting a data signal [en] to a first stage inverter of the plurality of stage inverters [fig.1].

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- In the plurality of stage inverters, means for coupling an output of an upstream stage inverter to an output of a downstream stage inverter, wherein each stage inverter either adds or does not add a lower slew rate to the data signal according to a position of the switch coupled to each stage inverter, and wherein an output of a last downstream stage inverter of the plurality of stage inverters is the data signal having an adjusted slew rate that is a result of a total number of the plurality of stage inverters that have been enabled by the switches to a lower slew rate of the data signal [col.4, l.46 – col.5, l.4].

31. It would have been obvious to one of ordinary skill in the art, having the teachings of Do, Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee before him at the time the invention was made, to modify the system taught by Faunce, Zou, Kuroiwa, Wakeley, Clow and Lee to include the teachings of Do, in order to obtain the claimed data transfer system. One of ordinary skill in the art would have been motivated to make such a combination as it provides a flexible way to control slew rates [Do: col.3, ll.19-28].

32. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zou, Kuroiwa, Wakeley, Clow and Lee as applied to claim 21 above, and further in view of Clay.

33. Zou, Kuroiwa, Wakeley, Clow and Lee disclose each and every limitation as discussed above in reference to claim 21. Zou, Kuroiwa, Wakeley, Clow and Lee did not disclose explicitly that the table is stored in the hard disk drive.

34. Clay discloses a data transfer system [fig.1], wherein a table is stored in an ATA interface circuit in the hard disk drive [solid state drive emulating hard disk drive] [col.2, l.33 – col.3, l.24].

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35. It would have been obvious to one of ordinary skill in the art, having the teachings of Clay, Zou, Kuroiwa, Wakeley, Clow and Lee before him at the time the invention was made, to modify the system taught by Zou, Kuroiwa, Wakeley, Clow and Lee to include the teachings of Clay, in order to obtain the data transfer system wherein the table is stored in an ATA interface circuit in the hard disk drive. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to maintain and reference specific characteristics of an attaching device [Clay: col.2, l.33 – col.3, l.24].

36. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zou, Kuroiwa, Wakeley, Clow and Lee as applied to claim 21 above, and further in view of Do.

37. Zou, Kuroiwa, Wakeley, Clow and Lee disclose each and every limitation as discussed above in reference to claim 21. Zou, Kuroiwa, Wakeley, Clow and Lee did not disclose the details of a DRU.

38. Do discloses a DRU [fig.1] wherein the DRU comprises:

- Means for inputting a SRC signal [260] to a plurality of switches [42], wherein each switch is turned to a first or second position according to a bit in the SRC signal [fig.4]
- A separate DLC coupled to each of the switches [pair of MOS and resistors constitute DLC with delayed threshold voltage activation] [col.4, ll.1-45].
- A plurality of stage inverters [46, 48, ...], wherein a separate stage inverter is coupled to each of the DLCs [fig.1].
- Means for inputting a data signal [en] to a first stage inverter of the plurality of stage inverters [fig.1].

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- In the plurality of stage inverters, means for coupling an output of an upstream stage inverter to an output of a downstream stage inverter, wherein each stage inverter either adds or does not add a lower slew rate to the data signal according to a position of the switch coupled to each stage inverter, and wherein an output of a last downstream stage inverter of the plurality of stage inverters is the data signal having an adjusted slew rate that is a result of a total number of the plurality of stage inverters that have been enabled by the switches to a lower slew rate of the data signal [col.4, l.46 – col.5, l.4].

39. It would have been obvious to one of ordinary skill in the art, having the teachings of Do, Zou, Kuroiwa, Wakeley, Clow and Lee before him at the time the invention was made, to modify the system taught by Zou, Kuroiwa, Wakeley, Clow and Lee to include the teachings of Do, in order to obtain the claimed data transfer system. One of ordinary skill in the art would have been motivated to make such a combination as it provides a flexible way to control slew rates [Do: col.3, ll.19-28].

Response to Arguments

40. Applicant's arguments, filed June 27, 2005, have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

41. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tse Chen whose telephone number is (571) 272-3672. The examiner can normally be reached on Monday - Friday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tse Chen
July 18, 2005


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